UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,319	12/28/2001	Sanae Ito	217804US2	4735

				EXAMINER
22850	7590	05/31/2005		GEBRESILASSIE, KIBROM K

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ART UNIT	PAPER NUMBER
2128	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/028,319	ITO ET AL.
	Examiner	Art Unit	
	Kibrom K. Gebresilassie	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 December 2001</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-17</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-17</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>28 December 2001</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☒ Certified copies of the priority documents have been received in Application No. <u>10/028,319</u>.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____ .

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

1.   This action is responsive to the application filed December 28, 2001.

2.   Claims 1-17 have been examined.

Priority

3.   The priority date considered for this application is December 28,2000.

Oath/Declaration

4.   The Office acknowledges receipt of a properly signed oath/declaration filed

December 28, 2001.

Drawings

5.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5)

because they include the following reference character(s) not mentioned in the

description: **Figure 1, RAM 121**. Corrected drawing sheets in compliance with 37 CFR

1.121(d), or amendment to the specification to add the reference character(s) in the

description in compliance with 37 CFR 1.121(b) are required in reply to the Office action

to avoid abandonment of the application. Any amended replacement drawing sheet

should include all of the figures appearing on the immediate prior version of the sheet,

even if only one figure is being amended. Each drawing sheet submitted after the filing

date of an application must be labeled in the top margin as either "Replacement Sheet"

or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the

examiner, the applicant will be notified and informed of any required corrective action in

the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6.   Claim 16 is objected to because of the following informalities:

Claim 16 recites "The method". However, it depends on claim 9, which recites "A

computer program product".

Appropriate correction is required.

Claim Rejections - 35 USC § 101

7.   35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
conditions and requirements of this title.

1.   Claims 1-16 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter.

The Examiner submits that Applicant's have not <u>recited</u> any limitations relating to

a practical application in the technological arts and have merely claimed a manipulation

of processing steps. Section 2106 [R-2] (Patentable Subject Matter - Computer-Related

Inventions) of the MPEP recites the following:

"In practical terms, claims define nonstatutory processes if they:

- consist solely of mathematical operations without some claimed practical application

(i.e., executing a "mathematical algorithm"); or

- **simply manipulate abstract ideas**, e.g., a bid (Schrader, 22 F.3d at 293-94, 30

USPQ2d at 1458-59) or a bubble hierarchy (Warmerdam, 33 F.3d at 1360, 31

USPQ2d at 1759), **without some claimed practical application**."

In this case, claims 1-17 are simply drawn to the manipulation of abstract ideas (carrying out a simulation with the simulation data) as follows:

Claims 1,5-7: method of carrying out a simulation with simulation data, computing and displaying the influence of boundary conditions, prompting to enter an instruction whether or not the boundary conditions are changed and expanding the calculation area.

Claims 9, 13-15: a computer program product for carrying out a simulation with simulation data, computing and displaying the influence of boundary conditions, prompting to enter an instruction whether or not the boundary conditions are changed and expanding the calculation area.

An invention which is eligible for patenting under 35 U.S.C. § 101 is in the "useful arts" when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result. The fundamental test for patent eligibility is thus to determine whether the claimed invention produces a "**useful, concrete and tangible result.**" The test for practical application as applied by the examiner involves the determination of the following factors:

(1) "Useful" - The Supreme Court in Diamond v. Diehr requires that the examiner look at the claimed invention as a whole and compare any asserted utility with the claimed invention to determine whether the asserted utility is accomplished.

(2) "Tangible" - Applying In re Warmerdam, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir. 1994), the examiner will determine whether there is simply a computer program claimed, such as a disembodied data structure and step of making it. If so, the

claim involves no more than a manipulation of an abstract idea and therefore, is

nonstatutory under 35 U.S.C. § 101. In Warmerdam the abstract idea of a data

structure became capable of producing a useful result when it was fixed in a tangible

medium, which enabled its functionality to be realized.

(3) "Concrete" - Another consideration is whether the invention produces a

"concrete" result. Usually, this question arises when a result cannot be assured. An

appropriate rejection under 35 U.S.C. § 101 should be accompanied by a lack of

enablement rejection, because the invention cannot operate as intended without undue

experimentation.

The Examiner respectfully submits, under current PTO practice, that the claimed

invention does not recite either a useful, concrete, or tangible result and is merely drawn

to a manipulation of abstract ideas.

- The invention is not **useful** since the method and product of claims 1-16 does

  not recite a result that is useful in the technological art. This makes it difficult

  to determine Applicant's invention since it merely claims a manipulation of

  abstract ideas, which carrying out a simulation with simulation data.

- The claims are not **tangible** since, for example, the results of carrying out the

  simulation with the simulation data are not given. (See independent claims 1

  and 9, for example)

- The claims are not **concrete** because the results are not assured. For

  example, the out come of the simulation with simulation data is not definite.

  Because the result of the simulation with simulation data is not given.

Dependent claims 2,3,4,10,11 and 16 inherit this defect as being dependent from claims

1 and 9.

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   Claims 1, 6, 8, 9,14, 16, and 17 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent No. 6,099,574 issued to Fukuda in view of Japanese

Application No. 08-282456 issued to Hirotaka.

As per claim 1:

Fukuda discloses a method of carrying out a simulation (simulation; see col. 15,

line 18) with simulation data (see col. 15, lines 15- 17), comprising:

determining whether or not the simulation data (see col. 15, lines

15- 17) includes boundary conditions (boundary condition; see col. 15, line

30) set for the simulation (simulation; see col. 15, line 18)

computing the influence of the boundary conditions (boundary

condition; see col. 15, line 30) if the simulation data (see col. 15, lines 15-

17) include the boundary conditions;

displaying the influence of the boundary conditions (boundary

condition; see col. 15, line 30);

prompting to enter an instruction (instruction; see col. 12, line 66)

whether or not the boundary conditions are changed; and

if an instruction (instruction; see col. 12, line 66) to make no change

in the boundary conditions (boundary condition; see col. 15, line 30) is

entered, carrying out the simulation (simulation; see col. 15, line 18) with

the simulation data(see col. 15, lines 15- 17).

Fukuda fails to disclose a calculation area. However, Hirotaka discloses a

calculation area (calculation region; see the abstract section starting with "PROBLEM

TO BE SOLVED ..." on page 1, line 1).

It would have been obvious to one having ordinary skill in the art to modify the

method of Fukuda to use a calculation area as taught by Hirotaka. The motivation for

doing so would have been more convenient to run a simulation with minimum

computation time and smaller memory capacity for three-dimensional calculations.

As per claim 6:

Hirotaka discloses the method as claimed in claim 1, wherein: the boundary

conditions include one of fixed, mirror, periodic, transmission, and infinite boundary

conditions (reflective mold boundary condition; see page 4, [0004], line 3).

As per claim 8:

Hirotaka discloses the method as claimed in claim 1, wherein computing and

displaying the influence of the boundary conditions includes: computing and displaying

information about the accuracy (accurate simulation; see page 6, [0023], line 14) and

speed of the simulation (simulation at high speed; see page 7, [0027], lines 3-4) to be

carried out with the simulation data including the boundary conditions.

As per claim 9:

The limitation of claim 9 has already been discussed in the rejection of claim 1. It is

therefore rejected under the same rationale.

As per claim 14:

The limitation of claim 14 has already been discussed in the rejection of claim 6.

It is therefore rejected under the same rationale.

As per claim 16:

The limitation of claim 16 has already been discussed in the rejection of claim 8.

It is therefore rejected under the same rationale.

As per claim 17:

Fukuda discloses a semiconductor device manufacturing method (semiconductor

device fabrication processes; see Abstract, line 10), comprising:

designing a semiconductor device (semiconductor device; see col. 15,

lines13);

outputting design data (input data; see col. 15, lines 54-55) the

semiconductor device;

simulating the design data(input data; see col. 15, lines 54-55) of the

semiconductor device employing a simulation data(see col. 15, lines 15- 17) in

connection with the semiconductor device, the simulating comprising:

fabricating the semiconductor device (see col. 15, lines12-13) according to the design data.

10.   Claims 5, 7, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,099,574 issued to Fukuda and Japanese Application No. 08-282456 issued to Hirotaka as applied to claims 1, 6, 8, 9,14, 16, and 17 above, and further in view of Japanese Application No. 03-247342 by Kenichi.

As per claim 5 and 7:

Fukuda and Hirotaka fail to disclose an expanded calculation area and changeable boundary calculation area. However, Kenichi discloses an expanded calculation area and changeable boundary calculation area (see page 1, "CONSTITUTION..." lines 6-12).

It would have been obvious to one having ordinary skill in the art to modify the method of Fukuda and Hirotaka to expand and change the boundary calculation area as taught by Kenichi. The motivation for doing so would have been more convenient to reduce the computation time, detect and correct errors before the calculation is getting complex.

As per claim 13 and 15:

The limitations of claims 13 and 15 have already been discussed in the rejection of claims 5 and 7. They are therefore rejected under the same rationale.

11.   Claims 2, 3, 4, 10, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,099,574 issued to Fukuda in view of Japanese

Application No. 08-282456 issued to Hirotaka as applied to claims 1, 5-9, and 13-17

above, and further in view of U.S. Patent No. 5,821,911 by Jachimowicz.

As per claim 2:

Fukuda and Hirotaka fail to disclose virtual images and real images. However,

Jachimowicz discloses virtual images (see col. 2, line 27) and a real image (see col. 2,

line 23).

At the time of the invention, it would have been obvious to a person of ordinary

skill in the art to combine the real and virtual images of Jachimowicz with Fukuda and

Hirotaka. The motivation would have been to provide the user to control or see the

images of the simulation and make corrections as needed.

As per claim 11:

Fukuda discloses a generating module configured to generate virtual images

outside the calculation area according to boundary conditions other than the boundary

conditions (device structures and impurity distribution profiles; see col. 15 lines 29-32)

included in the simulation data.

As per claim 3,4, 10, and 12:

The limitations of claims 3, 4, 10, and 12 have already been discussed in the

rejection of claim 2. They are therefore rejected under the same rationale.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

13.   Any inquiring concerning this communication or earlier communication from the

examiner should be directed to Kibrom K. Gebresilassie whose telephone number is

(571) 272-8571. The examiner can normally be reached on Monday-Friday, 8:30 am to

4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner

supervisor, Jean R. Homere can be reached at (571) 272-3780. The official fax

number:(703) 872-9306. Any inquiring of a general nature relating to the status of this

application should be directed to the group receptionist whose telephone number is:

(571) 272-3700.

JEAN R. HOMERE
PRIMARY EXAMINER